WHAT IS CLAIMED IS:

1. A modular electronic system comprising:

a substrate;

a chip;

means for powering said chip; and,

means for capacitively signalling between said chip and said substrate.

2. A modular electronic system as defined in claim 1 wherein said chip includes a plurality of electronic devices.

3. A modular electronic system as defined in claim 2 wherein said chip includes digital circuitry.

4. A modular electronic system as defined in claim 2 wherein said chip includes an application specific integrated circuit or sensor.

5. A modular electronic system as defined in claim 2 wherein said chip includes a nanomechanical actuator.

6. A modular electronic system as defined in claim 2 wherein said chip includes a means for position registration or alignment.

7. A modular electronic system as defined in claim 1 wherein said chip includes a sensor.

8. A modular electronic system as defined in claim 1 wherein said means for powering said chip can be selectively impaired.

9. A modular electronic system as defined in claim 1 wherein said means for powering said chip comprises a conductive connection between said chip and said substrate.

10. A modular electronic system as defined in claim 9 wherein said conductive connection comprises a conductive fluid or paste.

11. A modular electronic system as defined in claim 9 wherein said conductive connection includes solder or eutectic metal.

12. A modular electronic system as defined in claim 9 wherein said conductive connection comprises a metallic fuzz button.

13. A modular electronic system as defined in claim 1 wherein said substrate comprises:

a power substrate coupled to said means for powering said chip; and,

a signal substrate coupled to said means for capacitively signalling.

14. A modular electronic system as defined in claim 13 wherein said signal substrate includes one or more transmission lines.

15. A modular electronic system as defined in claim 1 further comprising a plurality of leads connected to said substrate and configured to provide a conventional level 1 package lead-out for said system.

16. A modular electronic system as defined in claim 1 further comprising a plurality of leads connected to said substrate and configured to provide a conventional level 2 package lead-out for said system.

17. A modular electronic system as defined in claim 2 wherein said means for powering said chip includes a power distribution network located in said substrate.

18. A modular electronic system as defined in claim 1 further including a means for positioning said chip relative to said substrate.

19. A modular electronic system as defined in claim 18 wherein said means for positioning said chip relative to said substrate comprises a bonding agent.

20. A modular electronic system as defined in claim 18 wherein said means for positioning said chip relative to said substrate comprises a mechanical support.

21. A modular electronic system as defined in claim 18 wherein said means for positioning said chip relative to said substrate includes fiduciary markings.

22. A modular electronic system as defined in claim 18 wherein said means for positioning said chip relative to said substrate is responsive to the capacitance of said means for capacitively signalling.

23. A modular electronic system as defined in claim 1 further including a means for dissipating heat.

24. A modular electronic system as defined in claim 23 wherein said means for dissipating heat includes a material selected from the group consisting of: an elastomeric material, a eutectic material, a solder, a metal, grease, a wax, an oil, or diamond.

25. A modular electronic system as defined in claim 23 wherein said means for dissipating heat includes a material with high thermal conductivity.

26. A modular electronic system as defined in claim 1 wherein said substrate further includes a transmission line coupled to said means for capacitively signalling.

27. A modular electronic system as defined in claim 26 wherein said transmission line comprises a stripline, a microstrip or a slotline.

28. An electronic system comprising:

a substrate having first and second facing surfaces;

a plurality of electronic devices implemented on said substrate, at least one of said plurality of microelectronic devices coupled to a first half-capacitor implemented on or beneath said first surface; and,

a second half-capacitor implemented on or beneath said second surface and capacitively coupled to said first half-capacitor.

29. A method for implementing an electronic system comprising:

fabricating a plurality of electronic devices on a substrate;

fabricating a first half-capacitor in a first region on or beneath the surface of said substrate;

fabricating a second half-capacitor in a second region on or beneath the surface of said substrate; and,

deforming said substrate so that said first and second regions face, thereby capacitively coupling said first and second half-capacitors.

30. A modular electronic system as defined in claim 1 wherein said substrate further includes a transmission line coupled to said means for capacitively signalling.

31. A modular electronic system as defined in claim 30 wherein said transmission line is further coupled to a second means for capacitively signalling.

32. A modular electronic system as defined in claim 31 wherein the power needed to propagate a signal from said means for capacitively signalling, via said transmission line, to said second means for capacitively signalling is substantially independent of the length of said transmission line, on said substrate, connecting said means for capacitively signalling with said second means for capacitively signalling.

33. A modular electronic system as defined in claim 31 wherein the power needed to drive a signal from a driver on said chip

to a receiver on said chip is substantially independent of the distance between said driver and receiver, said signal propagating to said substrate via said means for capacitively signalling, along said substrate via said transmission line and back to said chip via said second means for capacitively signalling.

34. A modular electronic system as defined in claim 31 wherein the power needed to drive a signal from a driver on said chip to a receiver on a second chip is substantially independent of the distance between said driver and receiver, said signal propagating to said substrate via said means for capacitively signalling, along said substrate via said transmission line and to said second chip via said second means for capacitively signalling.

35. A modular electronic system as defined in claim 1 wherein the capacitance of said means for capacitively signalling is selected to provide a high bandwidth connection to a transmission line.

36. A modular electronic system as defined in claim 1 wherein said means for capacitively signalling is adapted to have substantially lower parasitic inductance than would a conductive connection adapted for the same total use of chip area.

37. A modular electronic system as defined in claim 1 wherein said means for capacitively signalling comprises first and second coupled half-capacitors, said first half-capacitor being associated with said chip and said second half-capacitor being associated with said substrate, said first and second coupled half-capacitors comprising effectively overlapping conductive regions separated by a gap.

38. A modular electronic system as defined in claim 37 wherein at least one of said conductive regions comprises a plate.

39. A modular electronic system as defined in claim 37 wherein the capacitance of said means for capacitively signalling can be varied by changing the effective area of overlap between said conductive regions.

40. A modular electronic system as defined in claim 37 wherein portions of said chip are passivated, but not said first half-capacitor.

41. A modular electronic system as defined in claim 37 wherein said gap is at least partially filled with a dielectric.

42. A modular electronic system as defined in claim 41 wherein said dielectric comprises a uniform material.

43. A modular electronic system as defined in claim 41 wherein said dielectric accommodates mechanical guides.

44. A modular electronic system as defined in claim 41 further comprising a power connection extending through said dielectric.

45. A modular electronic system as defined in claim 41 further including passivation distinct from said dielectric.

46. A modular electronic system as defined in claim 45 wherein said dielectric has a substantially greater dielectric factor than does said passivation.

47. A modular electronic system as defined in claim 41 wherein said dielectric is bonded to said substrate.

48. A modular electronic system as defined in claim 41 wherein said dielectric provides a means for affixing said chip to said substrate.

49. A modular electronic system as defined in claim 1 wherein said means for capacitively signalling comprises

a first half-capacitor on said chip;

a second half-capacitor on said substrate;

a dielectric material interposed in the region between said first and second half-capacitors; and,

a conductive region disposed in said region;

said conductive region being capacitively coupled to said first half-capacitor and to said second half-capacitor, thereby providing a capacitive signal path between said chip and said substrate.

50. A modular electronic system as defined in claim 49 wherein said conductive region is patterned to define a capacitive signal path between said chip and said substrate.

51. A modular electronic system as defined in claim 1 wherein said means for capacitively signalling couples signals between said chip and said substrate without substantially changing the spectrum of said signals.

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52. A modular electronic system as defined in claim 1 wherein said means for capacitively signalling operates despite a substantial misalignment between said substrate and said chip.

13 2
53. A modular electronic system as defined in claim 37 further a comprising a plurality of coupled half-capacitors, a substantial area of said chip and a substantial portion of the area of said substrate being covered with effectively overlapping half-capacitors.

14 13
54. A modular electronic system as defined in claim 53 wherein at least one half-capacitor on said chip is connected to a chip ground, power, or other common reference signal.

15 13
55. A modular electronic system as defined in claim 53 wherein at least one half-capacitor on said substrate is connected to a substrate ground, power, or other common reference signal.

16 2
56. A modular electronic system as defined in claim 37 wherein the area of one of said conductive regions is greater than the area of the other of said conductive regions.

57. A modular electronic system as defined in claim 37 wherein the shape of one of said conductive regions differs from the shape of the other of said conductive regions.

58. A modular electronic system as defined in claim 37 wherein said first half-capacitor overlays circuitry.

59. A modular electronic system as defined in claim 37 wherein said chip further includes an additional half-capacitor on its backside.

60. A modular electronic system as defined in claim 1 further comprising a means for affixing said chip to said substrate.

61. A modular electronic system as defined in claim 60 wherein said means for affixing said chip to said substrate allows said chip to be detached from said substrate without use of heat.

62. A modular electronic system as defined in claim 61 wherein said means for affixing said chip to said substrate also allows said chip to be attached to said substrate without use of heat.

63. A modular electronic system as defined in claim 60 wherein said means for affixing said chip to said substrate allows said chip to be detached from said substrate without use of solvents.

64. A modular electronic system as defined in claim 63 wherein said means for affixing said chip to said substrate also allows said chip to be attached to said substrate without use of solvents.

65. A modular electronic system as defined in claim 60 wherein said means for affixing said chip to said substrate allows said chip to be detached from said substrate without damaging said chip or said substrate.

66. A modular electronic system as defined in claim 65 wherein said means for affixing said chip to said substrate also

allows said chip to be attached to said substrate without damaging said chip or said substrate.

67. A modular electronic system as defined in claim 60 wherein said means for affixing said chip to said substrate allows said chip to be attached to, and detached from, said substrate reversibly.

68. A modular electronic system as defined in claim 1 further comprising:

a second chip; and,

means for capacitively signalling between said second chip and said substrate.

69. A modular electronic system as defined in claim 68 wherein said substrate further includes a transmission line coupled to said means for capacitively signalling between said chip and said substrate and to said means for capacitively signalling between said second chip and said substrate.

70. A modular electronic system as defined in claim 68 wherein said chips are digital and employ different logic levels.

71. A modular electronic system as defined in claim 68 wherein said first and second chips include clocked digital circuits which operate at different clock rates.

72. A modular electronic system as defined in claim 71 wherein the clock rate of one of said chips operates without reference to the clock rate of the other of said chips.

73. A modular electronic system as defined in claim 68 wherein said first and second chips operate at different voltage levels.

74. A modular electronic system as defined in claim 68 wherein said chip and said second chip are fabricated with different technologies.

75. A modular electronic system as defined in claim 68 further comprising first means for affixing said chip to said substrate and second means for affixing said second chip to said substrate, said first and second means for affixing being independent, thereby isolating the mechanical requirements of said chips.

76. A modular electronic system as defined in claim 68 wherein said chip and said second chip have mutually incompatible chemistries.

77. A modular electronic system as defined in claim 68 wherein said chip and said second chip operate at substantially different temperatures.

78. A modular electronic system as defined in claim 68 wherein said chip is digital or multistate and wherein said chip can be replaced with a replacement chip, having a different number of logic states than said chip, without substantially disrupting the operation of said system.

79. A modular electronic system as defined in claim 68 further comprising first means for affixing said chip to said substrate and second means for affixing said second chip to said substrate, wherein said means for affixing means and said substrate substantially isolate the thermal environments of said chips from one another.

80. A chip adapted for installation in a substrate, said chip comprising:

a semiconductor die, including a plurality of digital gates implemented thereon; and,

a plurality of half-capacitors implemented on said die for capacitively coupling signals to said chip.

81. A chip as defined in claim 80 further comprising a terminal implemented on said die for conductively coupling power to said chip.

82. A chip as defined in claim 81 wherein said chip can be installed in a modular system without a wire-bonding or a soldering step.

83. A substrate adapted to accommodate a plurality of chips and provide power thereto and signal coupling therebetween, said substrate including:

a plurality of half-capacitors implemented on said substrate for capacitively coupling signals to and from said substrate; and,

a plurality of terminals implemented on said substrate for conductively coupling power from said substrate to said chips.

84. A chip adapted to receive a capacitively coupled digital signal, said chip comprising:

a die;

first and second half-capacitors implemented on said die; and,

means, implemented on said die, for receiving a differential signal via said first and second half-capacitors and for generating, from said differential signal, an output signal representing the digital information received by said chip.

85. A method of sending data from a first module to a second module in a modular digital system, said method comprising the steps of:

applying signals representative of the data to a first half-capacitor associated with said first module;

capacitively coupling said first half-capacitor to a second half-capacitor, associated with said second module; and,

receiving, at said second module and via said second half-capacitor, a signal related to the signals applied to said first half-capacitor.

86. A method of coupling signals between electronic devices in a modular electronic system, said method comprising the steps of:

locating a first subset of said electronic devices on a first chip;

locating a second subset of said electronic devices on a second chip; and,

aligning and affixing said first and second chips so as to capacitively couple said first and second chips.

87. A method of coupling signals between electronic devices in a modular electronic system as defined in claim 86 wherein the first and second chips are affixed to a base substrate thereby capacitively coupling said first and second chips via said substrate.

88. A method of assembling a multichip module comprising the steps of:

identifying a known-good chip; and,

installing said known-good chip into said multichip module such that said module provides power and a capacitively coupled signal connection to said chip.

89. The method of claim 88 further comprising the step of:

replacing selected ones of said installed chips to improve overall system performance.

90. A method of assembling a multichip or wafer-scale module comprising the steps of:

(a) fabricating a plurality of chips on a first substrate;

(b) inspecting a plurality of said chips;

(c) in response to step (b), selectively enabling or disabling selected power connections on a second substrate, said selected connections being associated with chips that failed the inspection(s) in step (b); and,

(d) mating said first substrate with said second substrate so as to power the chips which passed the step (b) inspection(s).

91. The method of claim 90 wherein step (d) involves affixing said second substrate to said first substrate such that said enabled or non-disabled power connections on said second substrate conductively contact respective pads on said chips.

92. The method of claim 91 wherein each of said chips further includes a half-capacitor and step (d) further involves capacitively coupling said half-capacitors to respective half-capacitors on said second substrate.

93. A method of replacing a chip in a multichip module comprising the steps of:

(a) identifying a chip to be replaced;

(b) removing said identified chip from said module;

(c) positioning and testing a replacement chip; and,

(d) if the replacement chip tests acceptably, using said replacement chip in said multichip module.

94. A method of assembling a modular electronic system from a stored description of the system, said method comprising the steps of:

(a) processing said stored description to identify a set of modules capable of being connected to implement said system;

(b) further processing said stored description and said set of modules to compute a physical placement of said modules on a base substrate and a pattern of half-capacitor contacts and wires on said base substrate to realize said system;

(c) physically processing said base substrate to realize said computed pattern of half-capacitor contacts and wires; and,

(d) mounting said modules on said processed base substrate to realize said system.

95. The method defined in claim 94 wherein step (c) utilizes a low resolution process.

96. The method defined in claim 94 wherein step (d) involves mounting said modules such that half-capacitor contacts on said modules align with said half-capacitor contacts on said substrate.

97. The method defined in claim 94 further comprising the steps of:

(e) testing said realized system; and,

(f) if said system fails the test, replacing a module to improve the performance of said system.

98. A method of constructing a modular digital system comprising the steps of:

(a) partitioning components of said modular system into at least two modules; and,

(b) providing a means for capacitively signalling between said modules.

99. A method of constructing a multichip module comprising the steps of:

(a) aligning a first chip to a substrate;

(b) affixing said first chip to said substrate such that half-capacitors on said first chip capacitively couple to respective half-capacitors on said substrate;

(c) aligning a second chip to said substrate; and,

(d) affixing said second chip to said substrate such that half-capacitors on said second chip capacitively couple to respective half-capacitors on said substrate.

100. A method of capacitively coupling signals between first and second chips, each said chip having a plurality of half-capacitors, said method comprising the steps of:

affixing said first chip to a substrate;

aligning said second chip to said first chip; and,

affixing said second chip to said substrate, thereby capacitively coupling corresponding half-capacitors on said first and second chips and providing direct capacitive coupling between said first and second chips.

101. A method of manufacturing an electronic system with very high yield, said method comprising the steps of:

(a) partitioning the system into a plurality of modules, the average size of each of said modules being less than a preselected limit related to the maximum size at which modules can be fabricated with high yield; and

(b) assembling said plurality of modules to provide capacitive coupling between said modules, thereby realizing said system.

102. A modular electronic system comprising:

a first module having a plurality of electronic devices and a first half-capacitor; and,

a second module having a second half-capacitor, said modules being positioned such that said first and second half-capacitors provide a capacitive signal path between said first and second modules.

103. A modular electronic system as defined in claim 102 wherein said system includes a means for powering said first module.

104. A modular electronic system as defined in claim 102 wherein said first module includes a plurality of digital circuits.

105. A modular electronic system as defined in claim 103 wherein said first module includes an application specific integrated circuit.

106. A modular electronic system as defined in claim 102 wherein said first module includes superconducting devices.

107. A modular electronic system as defined in claim 103 further comprising means for powering said second module.

108. A modular electronic system as defined in claim 107 wherein said means for powering said second module comprises a conductive connection between first and second terminals on said first and second modules, respectively.

109. A modular electronic system as defined in claim 108 further comprising:

an insertion surface on said second module, said insertion surface having a characteristic shape and exposing said second terminal and said second half-capacitor; and,

a receptacle surface on said first module, said receptacle surface exposing said first terminal and said first half-capacitor, said receptacle surface configured such that, when said insertion surface and said receptacle surface are abutted and aligned, said first and second half-capacitors capacitively couple and said first and second terminals conductively couple.

110. A modular electronic system as defined in claim 109 wherein a guide portion of said receptacle surface is shaped to match a corresponding guide portion of said insertion surface, said guide portions providing a means for aligning said insertion and receptacle surfaces.

111. A modular electronic system as defined in claim 108 wherein said conductive connection employs a metallic fuzz button.

112. A modular electronic system as defined in claim 102 wherein said second module comprises a backplane.

113. A modular electronic system as defined in claim 112 wherein said first module further includes a means for receiving power from said backplane.

114. A modular electronic system as defined in claim 103 wherein said first module further includes:

a plurality of sub-modules; and,

means for distributing power to said sub-modules.

115. A modular electronic system as defined in claim 114 wherein said sub-modules comprise standard parts.

116. A modular electronic system as defined in claim 102 wherein said first and second modules are monolithic integrated circuits each having at least one active surface whereon electronic devices can be implemented, said modules being positioned with their active surfaces facing each other.

117. A modular electronic system as defined in claim 102 wherein said first module is a wafer-scale integrated circuit.

118. A modular electronic system as defined in claim 117 wherein said wafer-scale integrated circuit includes a plurality of individually powered chips.

119. A modular electronic system as defined in claim 118 wherein said second module includes a means for selectively distributing power to selected ones of said plurality of individually powered chips.

120. A modular electronic system as defined in claim 119 wherein said means for selectively distributing power comprises a plurality metallic protrusions mounted on one of said modules

and conductively connected by springy abutment to corresponding contacts on the other module.

121. A modular electronic system as defined in claim 120 wherein selective power distribution is achieved by selectively enabling or disabling selected ones of said metallic protrusions.

122. A modular electronic system as defined in claim 119 wherein said selected ones of said plurality of chips are chosen in response to testing of said plurality of chips prior to assembly of said first and second modules to form said system.

123. A modular electronic system as defined in claim 103 further comprising a plurality of leads connected to said second module and configured to provide a conventional level 1 package lead-out for said system.

124. A modular electronic system as defined in claim 103 further comprising a plurality of leads connected to said second module and configured to provide a conventional level $1^1/_2$ package lead-out for said system.

125. A modular electronic system as defined in claim 103 further including a means for dissipating heat.

126. A modular electronic system as defined in claim 125 wherein said first module includes said means for dissipating heat.

127. A modular electronic system as defined in claim 125 wherein said means for dissipating heat comprises a heat sink thermally coupled to said system.

128. A modular electronic system as defined in claim 127 wherein the thermal coupling between said means for dissipating heat and said system operates primarily by conduction.

129. A modular electronic system as defined in claim 127 wherein the thermal coupling between said means for dissipating heat and said system operates primarily by convection.

130. A modular electronic system as defined in claim 102 wherein said first module further includes a transmission line coupled to said first half-capacitor.

131. A modular electronic system as defined in claim 130 wherein said transmission line is terminated.

132. A modular electronic system as defined in claim 130 wherein said transmission line connects a plurality of points together electrically.

133. A modular electronic system as defined in claim 132 wherein said plurality of points includes a plurality of listeners.

134. A modular electronic system as defined in claim 132 wherein said plurality of points includes a plurality of senders.

135. A modular electronic system as defined in claim 102 wherein the sizes of said first and second half-capacitors are selected to provide a high bandwidth connection to a transmission line.

136. A modular electronic system as defined in claim 102 wherein at least one of said half-capacitors comprises a plate.

137. A modular electronic system as defined in claim 102 further comprising means for varying the admittance of said capacitive signal path by changing the effective area of overlap between said half-capacitors.

138. A modular electronic system as defined in claim 102 wherein portions of said first module are passivated, said passivated portions not including said first half-capacitor.

139. A modular electronic system as defined in claim 102 further including a dielectric layer disposed between said half-capacitors.

140. A modular electronic system as defined in claim 139 wherein said dielectric layer is bonded to said first module.

141. A modular electronic system as defined in claim 139 wherein said dielectric layer is bonded to said second module.

142. A modular electronic system as defined in claim 139 wherein said dielectric layer provides a means for affixing said first module to said second module.

143. A modular electronic system as defined in claim 102 wherein said first and second half-capacitors are shaped such that the admittance of said capacitive signal path is substantially unaffected by a small misalignment between said first and second modules.

144. A modular electronic system as defined in claim 102 wherein the area of one of said half-capacitors is greater than the area of the other of said half-capacitors.

145. A modular electronic system as defined in claim 102 further comprising programmable means associated with said first module for altering the effective shape of said first half-capacitor, thereby programmably varying the effective capacitance between said first and second half-capacitors.

146. A modular electronic system as defined in claim 102 wherein the shape of one of said half-capacitors differs from the shape of the other half-capacitor.

147. A modular electronic system as defined in claim 146 wherein said shape of said one of said half-capacitors is designed to accommodate anticipated misalignment.

148. A modular electronic system as defined in claim 102 further comprising a means for affixing said first module to said second module.

149. A modular electronic system as defined in claim 148 wherein said means for affixing said first module to said second module allows said first module to be detached from said second module without use of heat.

150. A modular electronic system as defined in claim 149 wherein said means for affixing said first module to said second module also allows said first module to be attached to said second module without use of heat.

151. A modular electronic system as defined in claim 148 wherein said means for affixing said first module to said second module allows said first module to be detached from said second module without use of solvents.

152. A modular electronic system as defined in claim 151 wherein said means for affixing said first module to said second module also allows said first module to be attached to said second module without use of solvents.

153. A modular electronic system as defined in claim 148 wherein said means for affixing said first module to said second module allows said first module to be detached from said second module without damaging said first module or said second module.

154. A modular electronic system as defined in claim 153 wherein said means for affixing said first module to said second module also allows said first module to be attached to said second module without damaging said first module or said second module.

155. A modular electronic system as defined in claim 148 wherein said means for affixing said first module to said second module allows said first module to be attached to, and detached from, said second module reversibly.

156. A modular electronic system as defined in claim 103 further comprising:

a third module, including a plurality of electronic devices and a third half-capacitor, said third module being positioned such that said third half-capacitor is coupled to a fourth half-capacitor on said second module, thereby

providing a second capacitive signal path between said second and third modules.

157. A modular electronic system as defined in claim 156 further comprising a means for powering said third module.

158. A modular electronic system as defined in claim 157 wherein said means for powering said first module and said means for powering said third module both comprise conductive connections to said second module.

159. A modular electronic system as defined in claim 156 wherein said second module further includes a transmission line connecting between said second and fourth half-capacitors.

160. A modular electronic system as defined in claim 159 wherein pulsed signals are coupled between said first and third modules via said transmission line.

161. A modular electronic system as defined in claim 160 wherein said first and third modules are digital and employ different logic levels.

162. A modular electronic system as defined in claim 102 wherein said first and second modules both include a plurality of digital circuits.

163. A modular electronic system as defined in claim 162 wherein said first module further includes a digital transmitter coupled to said first half-capacitor and said second module further includes a digital receiver coupled to said second half-capacitor, thereby providing a digital signal path from said first to said second module.

164. A modular electronic system as defined in claim 163 wherein said first module further includes a digital receiver coupled to said first half-capacitor and said second module further includes a digital transmitter coupled to said second half-capacitor, thereby providing a bi-directional digital signal path between said first and second modules.

165. A modular electronic system as defined in claim 163 wherein said digital transmitter includes means for rapidly switching the voltage at said first half-capacitor between at least two distinct voltage levels.

166. A modular electronic system as defined in claim 165 wherein the switching means includes a digital logic gate.

167. A modular electronic system as defined in claim 165 wherein the switching means includes a CMOS inverter.

168. A modular electronic system as defined in claim 165 wherein said digital transmitter imparts a pulse waveform on said second half-capacitor.

169. A modular electronic system as defined in claim 168 further comprising:

a third half-capacitor located on said first module and coupled to said digital transmitter;

a fourth half-capacitor located on said second module and coupled to said third half-capacitor; and,

wherein said digital transmitter also imparts a substantially simultaneous pulse waveform on said fourth half-capacitor having a polarity opposite to the waveform on said third half-capacitor.

170. A modular electronic system as defined in claim 163 wherein said digital transmitter imparts a level waveform on said second half-capacitor.

171. A modular electronic system as defined in claim 170 further comprising:

a third half-capacitor located on said first module and coupled to said digital transmitter;

a fourth half-capacitor located on said second module and coupled to said third half-capacitor; and,

wherein said digital also transmitter imparts a substantially simultaneous level waveform on said fourth half-capacitor having a polarity opposite to the waveform on said third half-capacitor.

172. A modular electronic system as defined in claim 169 wherein said digital receiver receives pulse waveforms from said second and fourth half-capacitors.

173. A modular electronic system as defined in claim 163 wherein said receiver is responsive to the voltage difference between said second half-capacitor and a second differential input.

174. A modular electronic system as defined in claim 163 wherein said digital receiver receives pulse waveforms from said second half-capacitor and converts said waveforms into digital signals.

175. A modular electronic system as defined in claim 174 wherein said receiver includes a biasing means and a slicing means.

176. A modular electronic system as defined in claim 175 wherein said biasing means includes a voltage generator substantially tracking the behavior of other devices on said second module, and a resistive means connecting said voltage source to said second half-capacitor.

177. A modular electronic system as defined in claim 176 wherein said voltage generator includes a feedback connected CMOS inverter and wherein said resistive means includes one or more MOS transistors.

178. A modular electronic system as defined in claim 175 wherein said slicing means includes one or more inverters chosen with specified inverter thresholds.

179. A modular electronic system as defined in claim 175 wherein said slicing means comprises two CMOS inverters with differing ratios of NMOS and PMOS transistor sizes.

180. A modular electronic system as defined in claim 175 where said receiver further comprises a pulse-to-level converter.

181. A modular electronic system as defined in claim 180 wherein said pulse-to-level converter includes a digital flip-flop wherein the setting and resetting of said flip-flop is at least partially controlled by one or more outputs of said slicing means.

182. A modular electronic system as defined in claim 181 wherein the delay from said second half-capacitor to said flip-flop output is substantially identical through both the setting and resetting paths of the flip-flop.

183. A modular electronic system as defined in claim 175 further including signal conditioning means disposed between said second half-capacitor and said slicing means.

184. A modular electronic system as defined in claim 183 wherein said signal conditioning means includes a differential amplifier responsive to a differential signal received from said second half-capacitor and an additional differential input.

185. A modular electronic system as defined in claim 184 wherein said signal conditioning means comprises a DMC CMOS amplifier adapted such that the output voltage of said amplifier when both inputs are at substantially the same voltage is related to the switching thresholds of the inverters in slicing means.

186. A modular electronic system as defined in claim 163 wherein said digital receiver receives level waveforms and converts said waveforms into digital signals.

187. A modular electronic system as defined in claim 169 wherein said digital receiver receives level waveforms from said second and fourth half-capacitors, said level waveforms representing a differential signal.

188. A modular electronic system as defined in claim 163 wherein said digital receiver is responsive to the difference in voltage between said second half-capacitor and a second differential input.

189. A modular electronic system as defined in claim 188 wherein the digital receiver includes a biasing means, a signal conditioning means and a slicing means.

190. A modular electronic system as defined in claim 189 wherein said biasing means comprises:

voltage generator means for providing a DC voltage which tracks process variations;

first resistive means connected between said voltage generator means and said second half-capacitor; and

second resistive means connected between said voltage generator means and said second differential input.

191. A modular electronic system as defined in claim 189 wherein said signal conditioning means includes a differential amplifier which receives inputs from said second half-capacitor and said second differential input.

192. A modular electronic system as defined in claim 189 wherein said slicing means comprises one or more inverters chosen with specified inverter thresholds.

193. A modular electronic system as defined in claim 189 further including a pulse-to-level converter which receives input from said slicing means.

194. A modular electronic system as defined in claim 193 wherein said pulse-to-level converter comprises a digital flip-flop wherein the setting and resetting of said flip-flop is at least partially controlled by one or more outputs of said slicing means.

195. A modular electronic system as defined in claim 194 wherein the delays from said second half-capacitor to the flip-flop

output are substantially identical through both the setting and resetting paths of the flip-flop.

196. A modular electronic system as defined in claim 102 further comprising:

a third half-capacitor on said first module; and,

a fourth half-capacitor on said second module, said third and fourth half-capacitors being coupled to provide a second capacitive signal path between said first and second modules.

197. A modular electronic system as defined in claim 196 wherein a signal is coupled between two points on said first module via said capacitive signal path, a transmission line in said second module, and said second capacitive signal path.

198. A modular electronic system as defined in claim 196, further comprising a plurality of additional half-capacitors coupled between said first and second modules, said additional half-capacitors providing additional paths for coupling signals in the manner specified in claim 197.

199. A modular electronic system as defined in claim 196 wherein a signal is coupled between two points on said second module via said capacitive signal path, said first module, and said second capacitive signal path.

200. A modular electronic system as defined in claim 199, further comprising a plurality of additional half-capacitors coupled between said first and second modules, said additional half-capacitors providing additional paths for coupling signals in the manner specified in claim 199.

201. A modular electronic system comprising:

a plurality of modules, two or more of said modules including a plurality of electronic devices and a plurality of half-capacitors connected to said electronic devices,

said modules being assembled into a substantially non-planar system wherein a plurality of signals are coupled to and/or from said two or more modules via said plurality of half-capacitors.

202. A modular electronic system as defined in claim 201 wherein said modules are assembled into a substantially space filling structure.

203. A modular electronic system as defined in claim 201 wherein said two or more modules are substantially planar, certain of said two or more modules being positioned in a substantially horizontal orientation and other(s) of said two or more modules being positioned in a substantially vertical orientation.

204. A modular electronic system comprising:

a first module including a first half-capacitor; and

a second module including a second half-capacitor coupled to said first half-capacitor, said second module further including:

a first sub-module having a third half-capacitor; and,

a second sub-module having a fourth half-capacitor coupled to said third half-capacitor.

205. A modular electronic system as defined in claim 204 wherein said first module further includes:

a third sub-module having a fifth half-capacitor; and,

a fourth sub-module having a sixth half-capacitor coupled to said fifth half-capacitor.

Add E' add F'